



## **McCALL FISH HATCHERY**

### **1999 Summer Chinook Salmon Brood Year Report**



**By**

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**IDFG 01-39  
November 2001**

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## ABSTRACT

The South Fork Salmon River trapping season began on July 8 with the weir installation and opening of the trap. Trapping operations concluded on September 10, 1999.

Chinook salmon *Oncorhynchus tshawytscha* spawning at the trap commenced on August 10 and concluded on September 10, 1999. A total of 1,961 returning chinook salmon were trapped, measured, and recorded during this period. The overall average eye-up from eggs taken from the South Fork stock was 83.7%.

Of the 1,961 fish trapped, 601 were females of which 469 were ponded; 101 were released above the weir. The pre-spawn mortality for females was 8.7%. There were 617 adult males trapped of which 455 were ponded and 134 were released above the weir. The pre-spawn mortality for the males was 9.9%. There were 743 jacks trapped (according to length frequency criteria), 37 were released, 10 were used for spawning. Due to the high numbers of jacks, there were 539 given to the tribes or charitable organizations.

From the females ponded, 427 South Fork stock were spawned with an average fecundity rate of 4,423 eggs per female, resulting in 1,892,572 green eggs taken. There were no Johnson Creek females this year. There were 120,339 eyed-eggs from reserve females given to the Sho-Ban tribe for egg boxes into the South Fork drainage.

During March 2001, there were 1,165,231 Brood Year 1999 smolts weighing 60,063 pounds transported and released at Knox Bridge on the South Fork Salmon River. In September 2000, there were 124,480 reserve summer chinook pre-smolts, weighing 2,855 pounds, transported and released into the South Fork Salmon River by Nez Perce fishery personnel.

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## INTRODUCTION

McCall Fish Hatchery (MCFH) was built in 1979 as a result of the Water Resources Development Act enacted by Congress in 1976. A portion of this Act is the Lower Snake River Fish and Wildlife Compensation Plan (LSRCP). The LSRCP compensates Idaho for fish and wildlife losses caused by the Lower Snake River Projects (Ice Harbor, Lower Monumental, Little Goose, and Lower Granite dams). The MCFH was the first hatchery built as a partial fulfillment of the LSRCP. The US Fish and Wildlife Service (USFWS) administers funding for LSRCP to the Department.

The MCFH is located within the city limits of McCall, Idaho along the North Fork of the Payette River, approximately 0.16 km (1/4 mile) downstream from Payette Lake.

A satellite facility for trapping and spawning adult chinook salmon *Oncorhynchus tshawytscha* is located on the South Fork Salmon River near Warm Lake, approximately 26 miles east of Cascade, Idaho.

The main production for MCFH is summer chinook reared to smolt size. There is also a resident trout program funded solely by the Department.

The first salmon reared at the MCFH were transferred in from the Mackay Fish Hatchery (MFH) and the Dworshak/Kooskia National Fish Hatchery complex. These eggs were the products of adult summer chinook trapped at Little Goose and Lower Granite dams. The first eggs from the South Fork of the Salmon River were received in August 1980.

## OBJECTIVES

The mitigation goal is to return 8,000 adult summer chinook salmon above Lower Granite Dam. The objectives of the MCFH are:

1. Restore summer chinook salmon to the South Fork Salmon River; historically a major summer chinook stream in Idaho.
2. Trap and spawn adult salmon returning to the South Fork Salmon River.
3. Raise 1,000,000 summer chinook smolts for release into the South Fork Salmon River.
4. Work with management and research to identify optimum operating procedures for the MCFH.

## **FISH REARING FACILITIES**

The hatchery facility consists of six buildings on approximately 15 acres. The largest building contains a shop, parking garage, incubation and early rearing area, generator room, and feed/freezer room. The office and a 3-bedroom dormitory are contained in one building. There is a visitor center with restrooms, a flow chart for a self-guided tour, and historical information signs. There are three residences for permanent personnel also located on the site.

The fish production facilities include:

1. Twenty-six eight-tray stacks of FAL (Flex-A-Lite, Consolidated) vertical flow (Heath type) incubators.
2. Fourteen concrete vats 4-ft x 40-ft x 2-ft (water depth); 320 cubic feet of rearing area per vat.
3. Two concrete rearing ponds 196-ft x 40.5-ft x 4-ft (water depth); 23,814 cubic feet of rearing space per pond.
4. One concrete collection basin 101-ft x 15-ft x 4-ft (water depth). The hatchery is designed to raise a maximum capacity of 1,000,000 smolts, averaging 17 fish per pound.

An adult trapping and spawning facility is located on the South Fork of the Salmon River near Warm Lake. This facility is equipped with a removable weir, fish ladder, trap, two adult holding ponds (10-ft x 90-ft), and a covered spawning area. Water is supplied from the South Fork Salmon River through a 33-inch underground pipeline. Holding capacity for the facility is approximately 1,000 adult salmon. Some adults are passed above the weir to spawn naturally, with an additional group transported to Stolle Meadows for Idaho Supplementation research. Eggs collected at the facility are transported "green" to MCFH for incubation and rearing.

## **WATER SUPPLY**

Hatchery water is obtained by gravity flow from Payette Lake through a 36-inch underground pipeline. Water may be taken from the surface or up to a depth of 50 ft, thus providing the capability of obtaining optimum rearing water temperatures.

Through an agreement with the Payette Lake Reservoir Company, 20 cubic feet per second (cfs) of water flow is available for hatchery use. Design criteria and production goals were established using this constraint, ensuring the hatchery has enough water to meet its production goals.

Water quality analysis reveals a somewhat "distilled" system for rearing fish (Appendix 12). The pH stays about 6.8. There is no indication of problems with heavy metals and temperature is maintained at 52°F to 56°F, with a low of 37°F.

## **STAFFING**

The hatchery is staffed with three permanent employees: a Hatchery Manager II, an Assistant Hatchery Manager, and a Fish Culturist. In addition, there are four temporary employees to assist during the busy field season.

## **TRAPPING AND SPAWNING**

The 1999 trapping season was delayed until July 8, 1999 due to high water. The first fish was trapped on July 9. Trapping continued through September 10, 1999. Normal trap installation is usually around June 20 with the fish arriving shortly thereafter. The peak of the run for 1999 was July 17.

There were 1,961 fish trapped; 601 (30.7%) were females, and 1,360 (69.3%) were males. A total of 743 males (37.9%) were jacks (three-year-old-fish) according to length frequency criteria. There were 101 females, 134 adult males, and 37 jacks released upstream of the weir.

Trap data obtained from the fish included fork length, sex, and mark type. All of the fish were also checked for internal and external tags.

The run consisted of 1,670 marked (85.2%) and 291 (14.8%) unmarked fish. Several of the fish were tagged more than once. Sixteen of the supplementation fish were visual implant elastomer (VIE) tagged, (12) fluorescent orange, and (4) green. The tags proved somewhat difficult to locate. Close observation is required to identify this mark. Of the tags recovered or detected, 228 were PIT tags, 16 were visual implant elastomer tags (VIE), and 1 jaw tag.

From the 1,961 fish trapped, there were 226 snouts removed from adipose fin-clipped (AD) fish indicating coded-wire tags (CWT). These were sent to the lab in Lewiston, Idaho for tag removal.

The age-class determination by length frequency was used at the trap site during initial trapping. The CWT recovery data and scale analysis show an overlap of age-classes originally determined using length frequency (Appendix 1).

Fork lengths were taken on all of the fish trapped, and all of the adult fish were injected with Erythromycin (Erythro 200) at a rate of 10 mg/kg.

Of the total number of fish released, 272 (171 male, 101 female) were released above the weir at the time of trapping. There were no fish held for later release. The percent release for unmarked males and females was 72.5% and 77.5%, respectively. There were 62 excess fish released below the weir for spawning.

A total of 1,627 SFSR stock adults were held for hatchery production. Pre-spawn mortality for the females was 8.7% and 9.9% for the males. There were no Johnson Creek adult salmon held at the South Fork trap this season. Spawn-taking activities started on August 10 and ended on September 10, 1999. One female was culled on-site for gross clinical signs consistent with bacterial kidney disease (BKD). Nez Perce fisheries workers were present during several spawn days to collect sperm for cryogenics preservation. A total of 1,892,572 green eggs were taken from

427 females for an average fecundity rate of 4,453 eggs per female. There were 23 unmarked females (8 left ventral clipped, 5 right ventral clipped) spawned for supplementation research, and 391 females for reserve or production fish. The average eye-up rate was 83.7%. All eggs taken were water-hardened for one hour in a 200-ppm titrateable iodine solution prior to being transported to the hatchery. The fecundity rate is estimated at 4,500 eggs per female until the eye-up stage is reached and the eggs are enumerated. At eye-up, the eggs are shocked by siphon, picked with an electronic picker, and enumerated by displacement and an electronic counter. The overall eye-up totaled 1,480,273 eggs from the SFSR stock. Spawning mortalities were returned to the river both above and below the weir for nutrient enhancement.

All of the spawned females were disease sampled by the pathologists from the Eagle Lab. The fish with ELISA values of 0.40 or greater were considered high-positive for BKD. A total of 123,207 South Fork stock eggs were culled out due to BKD.

The Sho-Ban tribe received 120,339 eyed reserve eggs from 34 females. These eggs were to be placed into stream incubation boxes within the South Fork drainage.

Incubator flows were set at a five-gallons per minute (gpm) rate, and, due to space concerns, incubators were loaded at 2 females per tray. The eggs were treated with 1,667 ppm of formalin for 15 minutes starting three days after fertilization and continuing on a daily basis until the eggs started to hatch.

Eggs eyed-up at approximately 600 thermal units (TUs) and were then shocked, picked, and enumerated. Hatching began at approximately 925 TUs.

## **FISH PRODUCTION**

### **Early Rearing**

Fry were sent out to the concrete vats approximately three days prior to initial feeding. Initial feeding begins between 1,750 and 1,775 TUs. Flows for the vats are set at 80 gpm and are loaded at 30,000 to 55,000 fish per vat, depending on the number of fish on hand. The vats start at half-length and are extended to full length when the density index (DI) reaches 0.30 to 0.35, usually around mid-February.

Beginning growth rates are slow, only 0.003-inch to 0.004-inch per day, due to cold water temperatures of only 37°F to 39°F. The fry are started on BioDiet #2 and #3 feed and remain on #3 until they reach 700 fish per pound. BioDiet feed has been used successfully at MCFH, using modified feed rates. The conversion rates average 1.1:1 to 1.5:1 during the fry- rearing stage.

Fish are moved to the outside rearing ponds mid-June and mid-July. They are adipose clipped, ventral clipped, coded wire tagged (CWT), and enumerated as they are moved to the ponds. There were 54,234 supplementation fish moved to the Stolle Meadows acclimation pond on August 2. By the end of August, there were 1,292,077 fish on station. Approximately 88,564 of these are supplementation fish and 124,551 are reserve South Fork stock for Nez Perce tribal releases in to the South Fork Salmon River below the weir site in late September (Appendix 13).



## **FISH HEALTH**

### **Diseases Encountered and Treatment**

During this past year, there has not been an epizootic that warranted medicated feed treatment. Two prophylactic erythromycin medicated feed treatments were applied to the South Fork fish under the Investigational New Animal Drug (INAD) 6013/4333 to limit losses to *Renibacterium salmoninarum*. Adult summer chinook salmon returning to the South Fork trap were injected with erythromycin to reduce pre-spawning mortality. This is provided by a veterinary extra-label exemption. During preliberation sampling on South Fork summer chinook, only *Renibacterium* was detected with ELISA at low optical densities. No other pathogens were detected utilizing standard sampling techniques at preliberation.

### **ORGANOSOMATIC INDEX.**

Summary of Fish Autopsy (Appendices 14a and 14b.)

### **Acute Losses**

No acute or chronic losses were experienced at McCall Fish Hatchery during this brood year.

### **Other Assessments**

The chinook at this facility appeared to be healthy, robust fish by all tested parameters. In the future, it would be wise not to overcrowd this facility with conservation programs until water supply improvements are met, and proper facility renovations are constructed.

## **FISH MARKING**

The fish marking crew was here in June and July and marked approximately 1.35 million fish. These fish receive Ad clips, CWT/Ad-clips, CWT only, and Left Ventral (LV) clips.

The marking crew returned in February and Passive Integrated Transponder (PIT) tagged 55,202 fish. The breakdown of tagged released fish appears in Appendix 13.

## **FISH DISTRIBUTION**

The Brood Year 1999 smolt hauling operation began on March 26 with the release of the reserve and supplementation fish, and concluded on the evening of the March 29. Approximately twenty-nine loads of fish were hauled in four days. The river conditions were clear and low at the time of release. All together 1,165,232 Brood Year 1999 smolts at 19.4 fish per pound totaling 60,063 pounds were released (Appendix 8).

Nez Perce Tribal fishery personnel transported 124,480 reserve pre-smolts to the South Fork of the Salmon River on September 28-29 for release.

## **EXPERIMENTS**

The supplementation research carried over to the Brood Year 1999 chinook. This project is designed in an attempt to generate more returning adults to natural spawning grounds. Supplementation smolts are the prodigy of unmarked adults. These fish were isolated within the hatchery until they could be differentially marked to ensure that genetic crossover with hatchery production fish would not occur. When these fish return as adults, a portion will be kept for spawning purposes to continue this program. There were 88,385 smolts released in the supplementation group that received a Left Ventral (LV) clip. These fish were released at the same time as the normal production group. There were 54,234 supplementation fish released into the acclimation pond that had been renovated near Stolle Meadows. These fish are to be volitionally released in the fall of 2000.

Low phosphate feed with a higher vitamin pack was utilized on the Brood Year 1999 fish with no adverse effects noted. This feed change resulted in a reduction of total phosphorous in the hatchery effluent water to the minimum detectable amount (Appendix 11).

## **CONCLUSIONS**

The Brood Year 1999 summer chinook released from MCFH were in excellent condition at release time. The overall survival rate to McNary Dam was estimated at 68.89% based on PIT tag recoveries at the dam. The culling program utilized on the BKD high-positive eggs had a positive effect on the overall health and condition of the fish. The release pipe and tempering pump were utilized again this year. The fish transport and stocking went smoothly despite slick, snowy roads and adverse weather conditions.

## **RECOMMENDATIONS**

It is recommended to continue utilizing low phosphate feed. All of the chinook eggs that tested high-positive for BKD were culled this year and should be continued, as egg numbers will allow. The gabion baskets need to be replaced to make a stable footing for the weir as the existing ones have rotted out over time. The entire asphalt driveway for the hatchery is in need of extensive repair or replacement.

## **APPENDICES**

Appendix 1. Age distribution of 1999 summer chinook returns to McCall Fish Hatchery, South Fork Salmon River, based on CWT data and length frequency data.

Age	Males		Females	
	CWT* Estimate	Length/ frequency Estimate	CWT Estimate	Length/ frequency Estimate
3	714	743	0	1
4	639	454	589	517
5	7	163	12	63
<b>Totals</b>	<b>1,360</b>	<b>1,360</b>	<b>601</b>	<b>601</b>

\*CWT data based on 217 tags recovered from 226 snouts  
Length data is taken at trapping prior to first sort.

Age-class  
breakdown

66 cm = three-year-olds, jacks  
67-89 cm = four-year-olds  
90 cm = five-year-olds

Appendix 2. Lengths of Brood Year 1999 fish trapped at McCall Fish Hatchery.

<b>Fork Length (cm)</b>	<b>Males</b>	<b>Females</b>
39	1	0
41	1	0
42	1	0
43	3	0
44	4	0
45	10	0
46	11	0
47	13	0
48	21	0
49	26	0
50	29	0
51	32	0
52	50	0
53	65	0
54	55	0
55	62	0
56	77	0
57	72	0
58	41	0
59	57	0
60	40	0
61	30	0
62	18	0
63	11	1
64	8	0
65	4	0
66	1	0
67	1	1
68	0	1
69	3	0
70	1	3
71	4	3
72	6	5
73	7	7
74	15	13
75	15	12
76	9	26
77	26	39
78	37	40
79	31	61
80	36	74
81	48	51
82	27	53
83	38	50
84	30	27
85	26	16
86	32	8

Appendix 2. Continued

<b>Fork Length (cm)</b>	<b>Males</b>	<b>Females</b>
87	22	10
88	18	11
89	22	6
90	13	6
91	6	8
92	8	5
93	5	16
94	6	13
95	2	10
96	6	10
97	5	6
98	7	5
99	8	1
100	14	2
101	9	1
102	14	0
103	8	0
104	11	0
105	8	0
106	7	0
107	6	0
108	10	0
109	0	0
110	6	0
111	3	0
112	0	0
113	0	0
114	0	0
115	0	0
116	0	0
117	0	0
118	1	0
<b>Totals</b>	<b>1360</b>	<b>601</b>

Appendix 3. Length frequency for Brood Year 1999 summer chinook broodstock at the South Fork of the Salmon River trap, according to Mark type recorded at McCall Fish Hatchery.

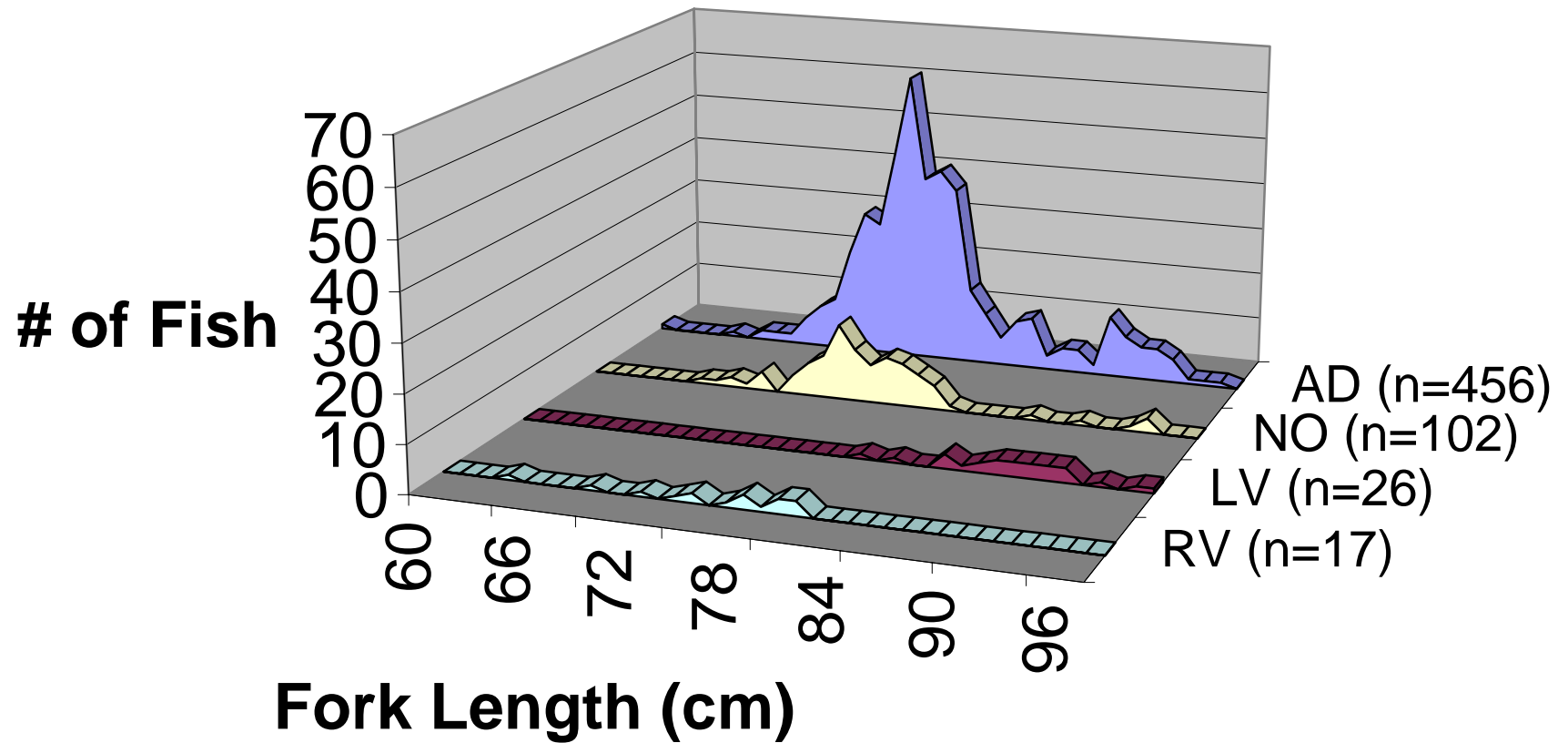
Fork Length (cm)	FEMALE					MALE					TOTAL
	AD	LV	NO	RV	SUM FE	AD	LV	NO	RV	SUM MA	
39	0	0	0	0	0	1	0	0	0	1	1
41	0	0	0	0	0	1	0	0	0	1	1
42	0	0	0	0	0	1	0	0	0	1	1
43	0	0	0	0	0	3	0	0	0	3	3
44	0	0	0	0	0	4	0	0	0	4	4
45	0	0	0	0	0	10	0	0	0	10	10
46	0	0	0	0	0	11	0	0	0	11	11
47	0	0	0	0	0	12	1	0	0	13	13
48	0	0	0	0	0	20	0	1	0	21	21
49	0	0	0	0	0	25	0	1	0	26	26
50	0	0	0	0	0	24	0	5	0	29	29
51	0	0	0	0	0	30	0	2	0	32	32
52	0	0	0	0	0	46	0	4	0	50	50
53	0	0	0	0	0	61	1	3	0	65	65
54	0	0	0	0	0	52	0	3	0	55	55
55	0	0	0	0	0	55	0	7	0	62	62
56	0	0	0	0	0	69	1	7	0	77	77
57	0	0	0	0	0	69	0	3	0	72	72
58	0	0	0	0	0	37	0	4	0	41	41
59	0	0	0	0	0	53	1	3	0	57	57
60	0	0	0	0	0	39	0	1	0	40	40
61	0	0	0	0	0	28	0	2	0	30	30
62	0	0	0	0	0	15	0	3	0	18	18
63	1	0	0	0	1	10	0	1	0	11	12
64	0	0	0	0	0	7	0	1	0	8	8
65	0	0	0	0	0	4	0	0	0	4	4
66	0	0	0	0	0	1	0	0	0	1	1
67	0	0	0	1	1	1	0	0	0	1	2
68	1	0	0	0	1	0	0	0	0	0	1
69	0	0	0	0	0	3	0	0	0	3	3
70	2	0	1	0	3	0	0	1	0	1	4
71	2	0	1	0	3	3	0	1	0	4	7
72	2	0	2	1	5	5	0	0	1	6	11
73	6	0	1	0	7	5	1	1	0	7	14
74	9	0	4	0	13	9	0	5	1	15	28
75	11	0	0	1	12	11	0	3	1	15	27
76	22	0	4	0	26	6	0	3	0	9	35
77	31	0	7	1	39	17	0	8	1	26	65
78	29	0	9	2	40	26	0	10	1	37	77
79	45	0	16	0	61	20	0	9	2	31	92
80	62	0	11	1	74	25	0	10	1	36	110
81	40	0	8	3	51	31	0	16	1	48	99

Appendix 3. Continued

Fork	FEMALE					MALE					TOTAL
Length (cm)	AD	LV	NO	RV	SUM FE	AD	LV	NO	RV	SUM MA	
82	42	0	10	1	53	20	0	7	0	27	80
83	38	0	9	3	50	23	0	14	1	38	88
84	16	1	7	3	27	24	0	4	2	30	57
85	11	0	5	0	16	19	0	5	2	26	42
86	6	1	1	0	8	24	0	6	2	32	40
87	10	0	0	0	10	17	0	5	0	22	32
88	11	0	0	0	11	15	0	3	0	18	29
89	3	3	0	0	6	12	2	8	0	22	28
90	5	1	0	0	6	10	1	1	1	13	19
91	5	2	1	0	8	2	1	2	1	6	14
92	2	3	0	0	5	6	1	1	0	8	13
93	13	3	0	0	16	4	1	0	0	5	21
94	9	3	1	0	13	4	0	2	0	6	19
95	7	3	0	0	10	2	0	0	0	2	12
96	7	3	0	0	10	2	3	1	0	6	16
97	5	0	1	0	6	3	1	1	0	5	11
98	1	1	3	0	5	6	0	1	0	7	12
99	1	0	0	0	1	6	2	0	0	8	9
100	1	1	0	0	2	8	6	0	0	14	16
101	0	1	0	0	1	9	0	0	0	9	10
102	0	0	0	0	0	10	1	3	0	14	14
103	0	0	0	0	0	7	0	1	0	8	8
104	0	0	0	0	0	7	2	2	0	11	11
105	0	0	0	0	0	5	3	0	0	8	8
106	0	0	0	0	0	5	1	0	1	7	7
107	0	0	0	0	0	4	1	1	0	6	6
108	0	0	0	0	0	8	2	0	0	10	10
110	0	0	0	0	0	4	1	1	0	6	6
111	0	0	0	0	0	2	0	1	0	3	3
118	0	0	0	0	0	0	0	1	0	1	1
<b>TOTAL</b>	456	26	102	17	<b>601</b>	1118	34	189	19	<b>1360</b>	<b>1961</b>

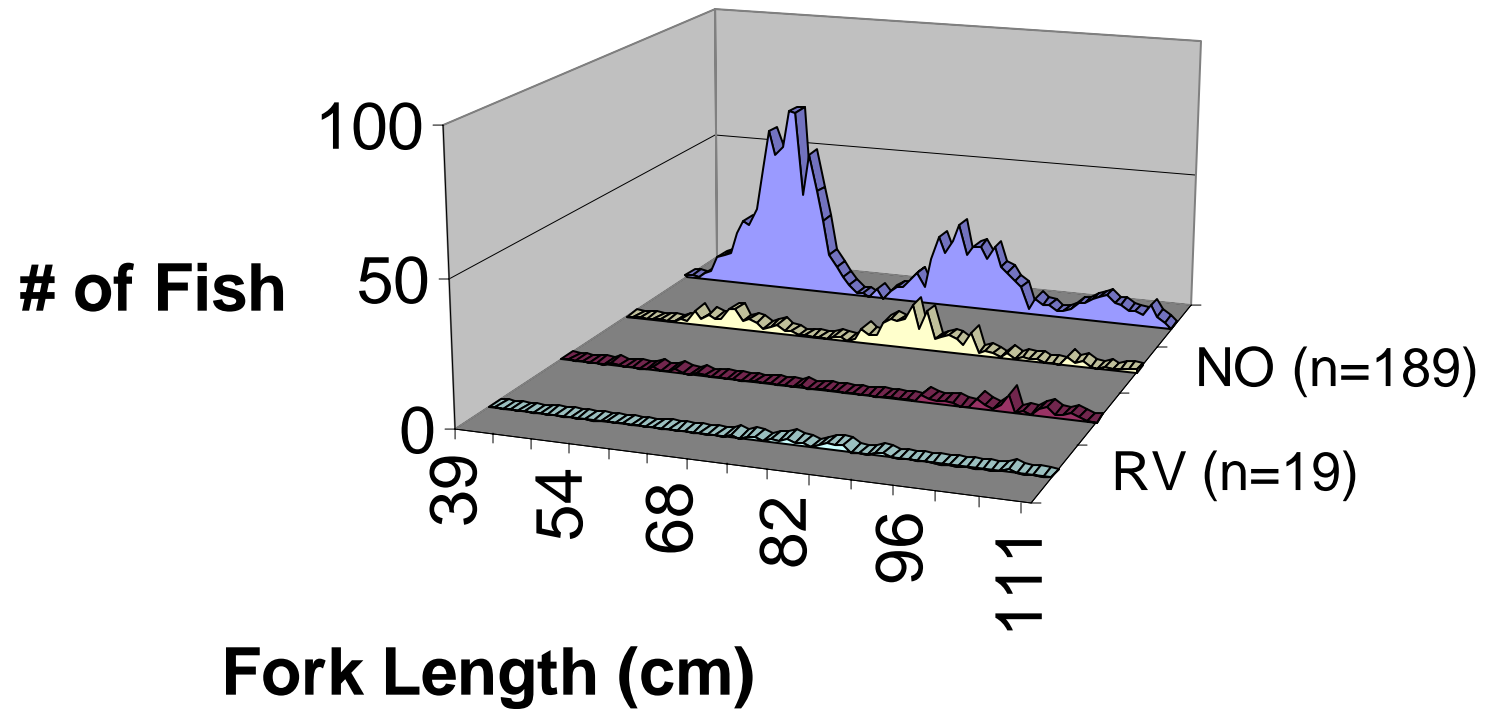


## Length Frequency - Females



Appendix 4a. South Fork Salmon River summer female chinook length frequency graph BY99.

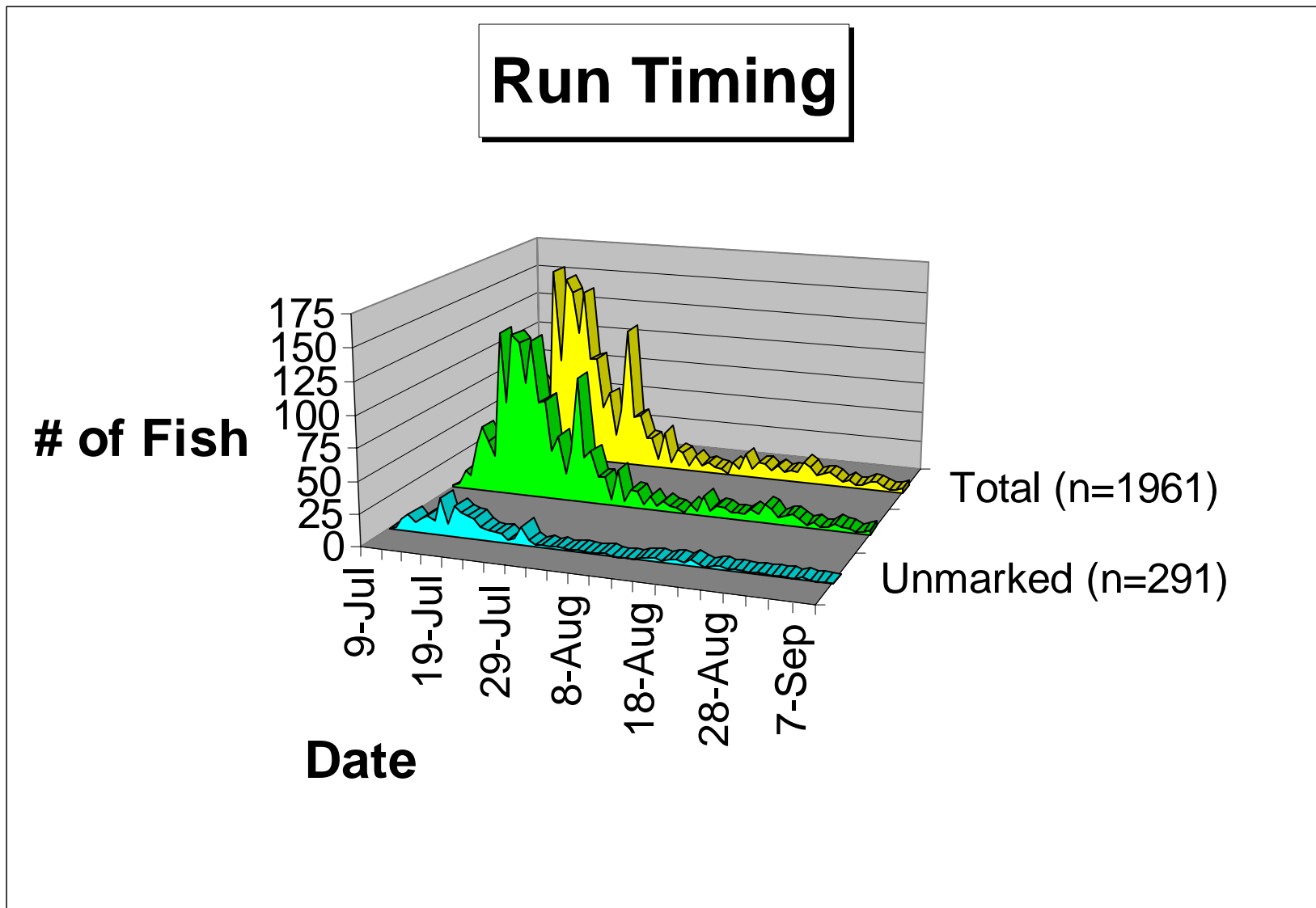
## Length Frequency - Males



Appendix 4b. South Fork Salmon River summer male Chinook length frequency graph BY99.

Appendix 5. McCall Fish Hatchery 1999 summer chinook run timing, South Fork Salmon River.

<b>Date</b>	<b>Number Trapped</b>	<b>Date</b>	<b>Number Trapped</b>
7/9	1	8/10	5
7/10	4	8/11	8
7/11	24	8/12	5
7/12	25	8/13	4
7/13	46	8/14	0
7/14	64	8/15	10
7/15	56	8/16	5
7/16	40	8/17	18
7/17	160	8/18	6
7/18	84	8/19	12
7/19	154	8/20	12
7/20	143	8/21	7
7/21	109	8/22	11
7/22	143	8/23	7
7/23	87	8/24	9
7/24	88	8/25	8
7/25	46	8/26	17
7/26	59	8/27	13
7/27	24	8/28	7
7/28	45	8/29	9
7/29	114	8/30	10
7/30	41	8/31	7
7/31	43	9/1	3
8/1	24	9/2	6
8/2	24	9/3	2
8/3	6	9/4	3
8/4	30	9/5	6
8/5	5	9/6	6
8/6	16	9/7	3
8/7	14	9/8	1
8/8	4	9/9	2
8/9	12	9/10	4
<b>Totals</b>		<b>1,961</b>	



Appendix 6. McCall Fish Hatchery South Fork Salmon River chinook run timing graph BY99

## Appendix 7. Historic hatchery releases and returns logged at McCall Fish Hatchery.

Brood Year	Release Year	Number of Fish	3-year-olds	Year Returned	4-year-olds	Year Returned	5-year-olds	Year Returned	Percent Returned
1978	1980	124,800	124	1981	462	1982	161	1983	0.598
1979	1981	248,926	48	1982	272	1983	221	1984	0.217
1980	1982	122,247	504	1983	713	1984	151	1985	1.119
1981	1983	183,896	595	1984	1,259	1985	203	1986	1.119
1982	1984	269,880	828	1985	1,265	1986	202	1987	0.850
1983	1985	564,405	1,222	1986	2,117	1987	893	1988	0.674
1984	1986	970,348	386	1987	1,392	1988	191	1989	0.255
1985	1987	958,300	50	1988	252	1989	30	1990	0.035
1986	1988	1,060,400	495	1989	911	1990	154	1991	0.147
1987	1989	975,000	28	1990	237	1991	25	1992	0.029
1988	1990	1,032,500	821	1991	2,617	1992	1,311	1993	0.030
1989	1991	708,600	206	1992	1,364	1993	299	1994	0.263
1990	1992	901,500	28	1993	158	1994	5	1995	0.021
1991	1993	607,298	70	1994	201	1995	37	1996	0.050
1992	1994	1,060,163	101	1995	424	1996	166	1997	0.065
1993	1995	1,074,598	738	1996	3,448	1997	555	1998	0.441
1994	1996	585,654	45	1997	343	1998	817	1999	0.206
1995	1997	238,367	76	1998	42	1999	0	2000	0.087
1996	1998	393,872	115	1999	0	2000	0	2001	0.000
1997	1999	1,182,615	0	2000	0	2001	0	2002	0.000
1998	2000	1,039,930	0	2001	0	2002	0	2003	0.000
1999	2001	1,165,231	0	2002	0	2003	0	2004	0.000

Appendix 8. Summer chinook distribution in the South Fork of the Salmon River from McCall Fish Hatchery

<b>Destination</b>	<b>Weight</b>	<b>Number/pound</b>	<b>Number released</b>
Knox Bridge	12,800	19.4	248,320
Knox Bridge	21,300	19.4	413,220
Knox Bridge	19,200	19.4	372,480
Knox Bridge	6,763	19.4	131,211
<b>Total Released</b>	<b>60,063</b>		<b>1,165,231</b>

Appendix 9. Brood Year 1999 summer chinook survival from green eggs to released smolts.

<b>Number of Green Eggs</b>	<b>Number of Eyed Eggs</b>	<b>Percent Survival</b>	<b>Ponded</b>	<b>Percent Survival</b>	<b>Released Smolts</b>	<b>Percent Survival</b>
1,892,572	1,480,273	83.70%	1,347,660	81.70%	1,165,231	79.20%

Totals do not include culled eggs from green egg total, eyed eggs given to the Sho-Bans, pre-smolts to the Nez Perce, and parr to Stolle Pond.

Appendix 10. Temperature range from August 1999 to April 2001 at McCall Fish Hatchery.

<b>Date</b>	<b>Temperature</b>
Aug-99	50.3
Sep-99	48.5
Oct-99	45.9
Nov-99	44.6
Dec-99	40.7
Jan-00	37.9
Feb-00	37.5
Mar-00	37.0
Apr-00	38.9
May-00	43.0
Jun-00	47.6
Jul-00	53.5
Aug-00	51.0
Sep-00	47.5
Oct-00	46.7
Nov-00	43.6
Dec-00	39.5
Jan-01	38.0
Feb-01	38.0
Mar-01	38.5
Apr-01	39.0



Appendix 11. Water analysis at McCall Fish Hatchery.

Date	pH	Ammonia	Nitrate	Nitrite	Total Phosphate	Total Nitrogen	KJEL Hardness	CaCO <sub>2</sub> Saturation	Oxygen ppm
1988	6.8	-	-	-	-	-	<10	97/103	7/10
1991		<0.05	<0.1	<0.1	<0.05	<0.10			
1993	6.9	<0.05	<0.1	<0.01	<0.05	<0.10			
1994	6.9	<0.05	<0.1	<0.01	0.01	<0.10			

Appendix 12. Brood Year 1999 production cost table.

Number of Fish	Pounds of Feed	Cost of Feed	Pounds of Fish	Conversion	Total Cost	Cost/1,000	Cost/Pound
1,165,231	68,393.00	\$75,902	60,063	1.1	\$405,594	\$348.15	\$5.93

Appendix 13. Brood Year 1999 marked fish released.

Date	Number of Marks Applied	Mark	Purpose	Number Marked Fish Released	Site/group Released
6/12-7/21/00	732,700	AD	Identification	674,095	1,165,231
7/10-7/21/00	349,343	AD/CWT	US-Canada	347,621	1,165,231
2/12-2/15/01	55,202	AD/PIT	Migration	55,130	1,165,231
7/10-7/21/00	88,595	LV	Supplementation	87,789	1,165,231
2/14/01	599	LV/PIT	Supplementation	596	1,165,231
7/10-7/21/00	54,274	CWT	Supplementation	54,234	54,234
7/10-7/21/00	125,044	AD/CWT	NPT	124,480	124,480
<b>TOTALS</b>	<b>1,405,757</b>			<b>1,343,945</b>	<b>1,343,945</b>

# Appendix 14a. Summary of fish autopsy.

SUMMARY OF FISH AUTOPSY			
ACCESSION NO:	00-316	LOCATION:	McCall Hatchery
SPECIES:	Chinook Summer	AUTOPSY DATE:	9/29/00
STRAIN:	SFSU	AGE:	Juv
UNIT:	All ponds sampled	SAMPLE SIZE:	20
REASON FOR AUTOPSY:	prelib		
INVESTIGATOR(S):	Munson		
REMARKS:			

	MEAN	STANDARD DEVIATION	COEFFICIENT OF VARIATION
LENGTH	0.00	0.00	0.00
WEIGHT	0.00	0.00	0.00
KTL*	0.00	0.00	0.00
CTL*	0.00	0.00	0.00
HEMATOCRIT	42	5.01	0.13
LEUCOCRIT	0.00	0.00	0.00
SERUM PROTEIN	5.5	.48	.01

\*EXPRESSED AT KTL TIMES 10 TO THE FIFTH POWER

\*\*CONVERTED FROM KTL; EXPRESSED AS CTL TIMES 10 TO FOURTH POWER

## VALUES AS PERCENTS OF TOTAL SAMPLE

EYES		GILLS		PSEUDO-BRANCHS		THYMUS		MESEN. FAT		SPLEEN		HIND GUT		KIDNEY		LIVER		BILE	
N	20	N	20	N	20	0	20	0	0	B	4	0	20	N	20	A	18	0	0
B1	0	F	0	S	0	1	0	1	2	R	16	1	0	S	0	B	2	1	0
B2	0	C	0	L	0	2	0	2	8	G	0	2	0	M	0	C	0	2	0
E1	0	M	0	S&L	0			3	10	NO	0			G	0	D	0	3	0
E2	0	P	0	I	0	Mean=0.00		4	0	E	0	Mean=0.00		U	0	E	0		
H1	0	OT	0	OT	0					OT	0			T	0	F	0	Mean=0.00	
H2	0			O	0			Mean=2.3								OT	0		
M1	0																		
OT	0																		

SUMMARY OF NORMALS									
20	20	20	20	20	20	20	20	20	20
SEX	M: 0		F: 0		U: 0				

GENERAL REMARKS:	
FINs: GOOD	GONADS:
SKIN:	OTHER:

# Appendix 14b. Summary of fish autopsy.

SUMMARY OF FISH AUTOPSY			
ACCESSION NO:	01-049	LOCATION:	McCall Hatchery
SPECIES:	Chinook Summer	AUTOPSY DATE:	3/13/01
STRAIN:	SFSU	AGE:	Juv
UNIT:	All ponds sampled prelib	SAMPLE SIZE:	20
REASON FOR AUTOPSY:			
INVESTIGATOR(S):	Munson		
REMARKS:			

	MEAN	STANDARD DEVIATION	COEFFICIENT OF VARIATION
LENGTH	0.00	0.00	0.00
WEIGHT	0.00	0.00	0.00
KTL*	0.00	0.00	0.00
CTL*	0.00	0.00	0.00
HEMATOCRIT	53.00	3.01	0.05
LEUCOCRIT	0.00	0.00	0.00
SERUM PROTEIN	10.1	1.1	0.11

\*EXPRESSED AT KTL TIMES 10 TO THE FIFTH POWER

\*\*CONVERTED FROM KTL; EXPRESSED AS CTL TIMES 10 TO FOURTH POWER

## VALUES AS PERCENTS OF TOTAL SAMPLE

EYES		GILLS		PSEUDO-BRANCHS		THYMUS		MESEN. FAT		SPLEEN		HIND GUT		KIDNEY		LIVER		BILE	
N	20	N	20	N	20	0	20	0	0	B	10	0	20	N	20	A	0	0	0
B1	0	F	0	S	0	1	0	1	1	R	10	1	0	S	0	B	16	1	0
B2	0	C	0	L	0	2	0	2	8	G	0	2	0	M	0	C	4	2	0
E1	0	M	0	S&L	0			3	8	NO	0			G	0	D	0	3	0
E2	0	P	0	I	0	Mean=0.00		4	5	E	0	Mean=0.00		U	0	E	0		
H1	0	OT	0	OT	0					OT	0			T	0	F	0	Mean=0.00	
H2	0			O	0			Mean=3.05								OT	0		
M1	0																		
OT	0																		

SUMMARY OF NORMALS									
	20		20		20		20		20
SEX		M: 0			F: 0			U: 0	

## GENERAL REMARKS:

FINS: GOOD

GONADS:

SKIN: LOSING SCALES

OTHER:

**Submitted by:**

Donald E. McPherson  
Fish Hatchery Manager II

Steven Kammeyer  
Assistant Fish Hatchery Manager

Joel Patterson  
Fish Culturist

Doug Munson  
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Tom Rogers  
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